

PATENT COOPERATION TREATY
PCT
INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Article 36 and Rule 70)

REC'D 15 JUN 2004

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| Applicant's or agent's file reference 30630-WO-U | FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416) | |
| International application No. PCT/BE 03/00072 | International filing date (day/month/year) 24.04.2003 | Priority date (day/month/year) 31.05.2002 |
| International Patent Classification (IPC) or both national classification and IPC B41M5/025 | | |
| Applicant TECHNI-COAT INTERNATIONAL ... et Al.] | AKZO NOBEL COATINGS INTERNATIONAL B.V. | |

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 4 sheets.

3. This report contains indications relating to the following items:

- I Basis of the opinion
- II Priority
- III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV Lack of unity of invention
- V Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI Certain documents cited
- VII Certain defects in the international application
- VIII Certain observations on the international application

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| Date of submission of the demand 24.12.2003 | Date of completion of this report 15.06.2004 |
| Name and mailing address of the International preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016 | Authorized Officer Bacon, A Telephone No. +31 70 340-3291 |



**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/BE 03/00072

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-16 as originally filed

Claims, Numbers

6-9, 10 (part) as originally filed
1-5 received on 06.01.2004 with letter of 24.12.2003
10 (part), 11-16 received on 25.05.2004 with letter of 25.05.2004

Drawings, Sheets

1/4-4/4 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- the language of publication of the international application (under Rule 48.3(b)).
- the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- contained in the international application in written form.
- filed together with the international application in computer readable form.
- furnished subsequently to this Authority in written form.
- furnished subsequently to this Authority in computer readable form.
- The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- the description, pages:
- the claims, Nos.:
- the drawings, sheets:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/BE 03/00072

5. This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).
(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)
6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | | |
|-------------------------------|-------------|------|
| Novelty (N) | Yes: Claims | 1-16 |
| | No: Claims | |
| Inventive step (IS) | Yes: Claims | 1-16 |
| | No: Claims | |
| Industrial applicability (IA) | Yes: Claims | 1-16 |
| | No: Claims | |

2. Citations and explanations

see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/BE03/00072

Re Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Novelty, Article 33(2) PCT:

The closest prior art document is WO-A-00/61376 (document D1, acknowledged by the applicant on page 1, lines 18-24, of the present description), which discloses a method for printing on three-dimensional objects in which printing ink is provided imagewise on a supple carrier. Subsequently this printing ink is transferred on to the three-dimensional object by bringing the object and the carrier into mutual contact, whereby the carrier is forced to follow the form of the surface of the object to be printed; no mention is made of curing at any stage of the printing process.

The other documents cited in the International Search Report relate to printing processes in which printed supple carriers are permanently adhered by means of adhesive on to objects on which it is desired to print.

The subject-matter of process Claim 1 differs from WO-A-00/61376, because at least one of the layers (denoted by numbers 10, 11 and 12 on Figure 1) is subjected to a curing treatment after printing the layers on the carrier but before transferring the layers on to the object to be printed.

Similarly, the subject-matter of independent product Claim 13 is distinguished from the closest prior art document (WO-A-00/61376) in that the printing device comprises two (or more) processing stations (denoted by numbers 3, 4, 5, 6, 7, 8 and 9 on Figure 10 and suitable for successively providing two (or more) layers of printing medium); only one processing station is mentioned in document D1.

In addition, the subject-matter of independent product Claim 15 is distinguished from WO-A-00/61376, because the gripping means (32) grips the carrier (13) within the circumference determined by the location where the carrier is connected to the holder (16) (i.e. the holder surrounds the gripping means, see Figures 11 and 12); the frame (8) is also the only possible gripping/clamping means mentioned in document D1, but cannot be located within its' own circumference.

Inventive Step, Article 33(3) PCT:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/BE03/00072

The present application seeks to solve the problem of ensuring correct registration of images when transferring several printed layers on to three-dimensional objects (see page 3, lines 8-12, of the description).

The subject-matter of independent Claims 1, 13 and 15 possesses an inventive step for the following reasons:

(a) the problem addressed by the application is not described in WO-A-00/61376 or in any of the other prior art documents cited in the International Search Report. For example, document D1 aims to solve the problem of printing on three-dimensional objects but only mentions transfer of one layer on to the object on which it is desired to print;

(b) problem of image-registration on three-dimensional objects is solved by the new subject-matter of the independent Claims as described in the preceding section regarding novelty, Article 33(2) PCT (see above); and,

(c) none of the documents cited in the International Search Report gives any indication whatsoever that this problem "could" (let alone "would") be solved by the process of Claim 1 or the apparatuses disclosed in Claims 13 and 15.

Claims 2-12, 14 and 16 are dependent Claims which relate to further embodiments of the subject-matter of the independent Claims 1, 13 and 15; these dependent Claims therefore also meet the requirements of Articles 33(2)-33(5) PCT.

Therefore, the underlying application satisfies the requirements of Articles 33(2)-33(4) PCT with respect to prior art as defined in Rule 64.1 PCT, because the subject-matter of Claims 1-16 is novel, possesses an Inventive Step, and is Industrially Applicable.

Claims.

1. Method for printing objects, whereby these objects (15) are provided with a multi-layered print, characterized in that to this aim, on one hand, two or more layers of printing medium (10-11-12), which at least partially are situated one above the other, are provided on a supple carrier (13) and, on the other hand, after that at least one of said layers (10-11-12) has been subjected to an at least partial curing treatment, these layers (10-11-12) are simultaneously transferred onto the object (15) to be printed by bringing said carrier (13), together with the layers of printing medium (10-11-12) present thereon, and the object (15) into mutual contact, and by removing the object (15) from the carrier (13) after the transfer of said layers (10-11-12) is completed.

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Claims.

- 1.- Method for printing objects, whereby these objects
5 (15) are provided with a multi-layered print,
characterized in that to this aim, on one hand, two or
more layers of printing medium (10-11-12), which at least
partially are situated one above the other, are provided
10 on a supple carrier (13) and, on the other hand, these
layers (10-11-12) are simultaneously transferred onto the
object (15) to be printed by bringing said carrier (13),
together with the layers of printing medium (10-11-12)
present thereon, and the object (15) into mutual contact.
- 15 2.- Method according to claim 1, characterized in that in
between the application of two or more layers of printing
medium (10-11-12), and possibly after the application of
the last layer of printing medium (12), one or more of
20 said layers (10-11-12) are subjected to a curing
treatment, preferably by means of an exposure to
ultraviolet radiation or by means of heating.
- 3.- Method according to claim 2, characterized in that a
partial curing is provided.
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- 4.- Method according to claim 2 or 3, characterized in
that at least two layers (10-11) are subjected to a
curing treatment and that the curing takes place in a
selective manner, such that, when curing the second layer
30 (11), little or no further curing of the first layer (10)
will take place.
- 5.- Method according to any of the preceding claims,
characterized in that the carrier (13), preceding the
35 application of the layers of printing medium (10-11-12),
is cleaned.

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12) finally, in said printing device (14), simultaneously are transferred onto the object (15) to be printed.

11.- Method according to any of the preceding claims,
5 characterized in that, during the transfer of said layers (10-11-12) onto the object (15), the carrier (13) is brought into contact with means forming a support for the carrier (13) around the object (15) to be printed and, more particularly, provide for a clamping of the carrier
10 (13).

12.- Method according to any of the preceding claims, characterized in that during the transfer of said layers (10-11-12) onto the object (15), the carrier (13) is brought into contact with a chamber-shaped part (34) which is open at one side (33), such that the open side (33) is sealed by the carrier (13) and a chamber is formed in which a pressure can be created with the purpose of assisting in pressing the carrier (13) around
15 the object (15).

13.- Device for printing objects, more particularly according to the method of any of the preceding claims, characterized in that it ~~at least consists of~~ ^{COMPRIMES}, on one hand, ~~more particularly~~ processing stations (3-4-
25 5-6-7-8-9), for successively providing two or more layers of printing medium (10-11-12) on a supple carrier (13), and, on the other hand, an actual printing device (14), where said layers (10-11-12) are transferred onto the object (15) to be printed, by bringing said carrier (13), together with the layers of printing medium (10-11-2)
30 present thereon, and the object (15) into mutual contact.

14.- Device according to claim ~~12~~ ^{or} 13, characterized in that it comprises a moving, more particularly rotatable, table (25), in which several carriers (13) are or can be

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provided, such that, by systematically rotating this table (25), the carriers (13), as aforementioned, end up in the respective processing stations (3-4-5-6-7-8-9) and the actual printing device (14).

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15.- Printing device for printing objects, of the type whereby printing medium (10-11-12) is transferred onto an object (15) by bringing a carrier (13), provided in a holder (16) and being provided with printing medium (10-11-12), into contact with the object (15), such that the printing medium (10-11-12) is transferred from the carrier (13) onto the object (15), characterized in that the printing device (14) comprises means (32) which grip, more particularly, clamp, the carrier (13) within the circumference determined by the location where the carrier (13) is connected to the holder (16).

20 16.- Printing device ~~for printing objects, of the type~~
whereby printing medium (10-11-12) is transferred onto an
object (15) by bringing a carrier (13), which is provided
with printing medium (10-11-12), into contact with the
object (15), such that the printing medium (10-11-12) is
~~transferred from the carrier (13) onto the object (15)~~,
characterized in that the printing device (14) comprises
25 a chamber-shaped part (34) which is open at one side
(33), whereby the open side (33) thereof can be sealed by
a carrier (13) presented or present in the printing
device (14), such that the chamber-shaped part (34) forms
a closed chamber in which a pressure can be created with
30 the purpose of assisting in pressing the carrier (13)
around the object (15).